

LOW DATA LINE CAPACITANCE IMAGE SENSOR ARRAY  
USING AIR-GAP METAL CROSSOVER

Robert A. Street

Ping Mei

Jeffrey T. Rahn

ABSTRACT

The signal-to-noise ratio of amorphous silicon (a-Si:H) image sensor arrays is limited by electronic noise, which is largely due to data line capacitance. To reduce data line capacitance, an air-gap (i.e., vacuum or gas-filled space) is produced at crossover points separating the data lines and gate lines. This air-gap crossover structure is formed by depositing a release material on the gate lines, forming the data lines on the release material, and then removing (etching) the release material such that the data lines form an arch extending over the gate lines. A dielectric material is then applied to strengthen the data line, and the sensor pixels are then formed.